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Indian Standard

METHOD FOR DETERMINATION OF RADIAL CRUSHING STRENGTH OF SINTERED METAL POWDER BEARINGS

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Indian Standard

METHOD FOR DETERMINATION OF RADIAL CRUSHING STRENGTH OF SINTERED METAL POWDER BEARINGS

0. FOREWORD

0.1 This Indian Standard was adopted by the Indian Standards Institution on 15 December 1982, after the draft finalized by Powder Metallurgical Materials and Products Sectional Committee had been approved by the Structural and Metals Division Council.

0.2 With the growth of powder metallurgical industry in the country, an increasing need has been felt for having standards on the methods for determination of various properties of sintered metallic powders. This standard is one of the series on this subject. It is hoped that the formulation of this standard will be of considerable use to the industry.

0.3 In the formulation of this standard, assistance has been derived from ISO 2739-1973 'Sintered metal bushes — Determination of radial crushing strength', issued by the International Organization for Standardization (ISO).

0.4 In reporting the result of a test made in accordance with this standard, if the final value, observed or calculated, is to be rounded off, it shall be done in accordance with IS : 2-1960*.

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1. SCOPE

1.1 This standard specifies a method for determination of radial crushing strength of sintered metal powder bearings in the form of hollow cylinders. It is applicable to bearings composed of pure or alloyed metal powders.

*Rules for rounding off numerical values (*revised*).

2. PRINCIPLE OF TEST

2.1 The test bearing is submitted to a continuously increasing radial load. The point at which the load suddenly drops due to the first crack is recorded and used to calculate a value in relation to the dimensions of the bearing known as 'Radial crushing strength'.

3. TEST APPARATUS

3.1 Pressing apparatus which enables a radial load to be applied to the bearing.

3.2 Load measuring device capable of giving the reading of the maximum value attained.

4. TEST PIECE

4.1 The test piece (Fig. 1) is to be in the form of a sintered hollow cylinder (for example, a plain cylindrical bearing) which may or may not be oil impregnated. The test piece shall not have flanges, notches, grooves, pronounced chamfers, drilled holes, oilways or keyways. If necessary the cylinder may be machined, but in this case the results obtained may differ from those obtained with a cylinder which has not been machined.

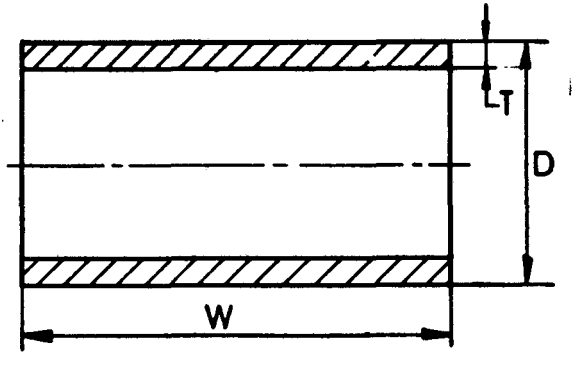

FIG. 1 TEST PIECE

4.2 If the test is applied to flanged bearings, the flange shall be cut off and the two sections tested separately. The test shall be void if the flange bends or twists during the test.

5. TEST PROCEDURE

5.1 The test piece shall be placed between two flat parallel plates of the pressing apparatus, the axis of the test piece being parallel to the planes of the plates (Fig. 2). The load shall be increased slowly and steadily so that the coefficient K (*see* **6.1**) increases at a rate between 2 and 20 N/mm^2 per second and that the test time is greater than 10 seconds. The point at which the load suddenly drops due to the first crack shall be recorded.

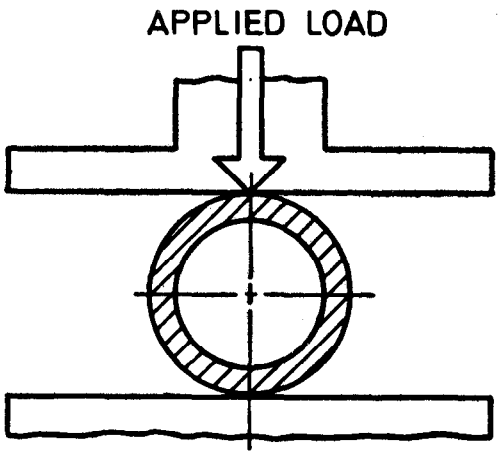

FIG. 2 TEST ARRANGEMENT

6. CALCULATION

6.1 The radial crushing strength of the bearing, K, in N/mm^2 shall be calculated by the following formula:

$$K = \frac{P\,(D - T)}{WT^2}$$

where

P = maximum load, in Newtons incurring fracture;
W = length, in millimetres, of the bearing;
D = outside diameter, in millimetres of the bearing; and
T = thickness, in millimetres, of the cylinder wall.

This formula is valid only if the ratio T/D is less than 1/3.

7. REPORT

7.1 The test report shall include the following information:

a) Reference to this Indian Standard;

b) All details necessary for identification of the specimen;

c) Whether the specimen has been machined or not, and if so a drawing showing how the specimen has been taken from the part;

d) Whether the specimen has been oil impregnated or not; and

e) Result obtained.